

EXHIBITS 1-3

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Exhibit 4

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Hi. I'm James from the Cloud and Data Center Business Unit at Maxim Integrated. Today, I would like to introduce Maxim's VR14 solutions. Maxim's VR14 solutions deliver the highest performance and power density for data centers. Maxim's VR14 solution comprises three main components. The first component is the MAX20856 Power Stage. This pin compatible, 5 millimeter by 6 millimeter common footprint power stage simplifies the supply chain, allowing second sources on a single motherboard design. The monolithic integration reduces parasitics, for improved performance and high efficiency. **The second component is the Boosted Coupled Inductor, or BCL. This patented technology enables a high-density solution with lower output capacitance.** It also has high efficiency and excellent transient performance. The BCL inductor is layout compatible with discrete inductors or with TLVR inductors, as seen in the overlay of the BCL footprint over a common inductor layout. The third component is the MAX20848 VR14 Dual Output Controller. The MAX20848 has internal compensation, minimizing external passive components around the IC and simplifying development. Extensive telemetry reporting and fault logging enable monitoring and aids troubleshooting. The MAX20848 is in a pin compatible, 48-pin, 6 millimeter by 6 millimeter package. On this slide, we compared the output capacitance required on the Intel CRB against the TLVR solution and the BCL solution. We will look at the capacitors in the socket cavity, the channel, and around the inductor. The Intel reference board uses a total of 7.6 millifarad, as seen in the table. Next, we see that the TLVR solution is able to replace the expensive 100-microfarad 0805

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4:24 June 04, 2021

Maxim VR14 solution delivers highest performance and power density for datacenters. This video demonstrates the extreme performance, high efficiency, and ultra-low output capacitance of the Maxim VR14 solution over conventional and new competitive technologies.

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this slide, we compared the output capacitance required on the Intel CRB against the TLVR solution and the BCL solution. We will look at the capacitors in the socket cavity, the channel, and around the inductor. The Intel reference board uses a total of 7.6 millifarad, as seen in the table. Next, we see that the TLVR solution is able to replace the expensive 100-microfarad 0805 capacitors with 47-microfarad ones, reducing the total capacitance by 40%, to 4.5 millifarad. The Maxim BCL solution further allows the 22-microfarad 0402 socket cavity capacitors to be replaced with 10-microfarad ones. Total output capacitance is just 3.6 millifarad, which is 21% lower than the TLVR solution and just 47% of the capacitance used on the Intel CRB. This results in considerable cost savings on the output capacitors. This slide demonstrates the advantage of the BCL solution over the TLVR solution in transient response. Despite the lower total output capacitance, as presented earlier, the BCL solution still has higher margin to design targets over the TLVR solution. This is possible because the lower effective inductance of the BCL inductor during transience allow for faster inductor current slew rates, resulting in lower undershoot on load increase and lower overshoot on load release. This slide compares the phase current ripple of the BCL inductor and the TLVR inductor. The BCL inductor, at 350 kilohertz, has similar peak-to-peak current ripple as the TLVR inductor, at 600 kilohertz. The lower switching frequency for BCL reduces switching losses, resulting in a 0.4% higher peak efficiency and a 0.8% higher TDC efficiency. This concludes this presentation of the Maxim VR14 solutions. To learn more about our VR14


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